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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/930,449	10/07/1997	HIROYUKI ABE	JAO-39514	3024

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EXAMINER

RAO, SHRINIVAS H

ART UNIT PAPER NUMBER

2814

DATE MAILED: 10/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

08/930,449

Applicant(s)

ABE ET AL.

Examiner

Steven H. Rao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 18, 20, 23-28, 30-33, 35-38, 40-43, 46-49 and 56-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1, 18, 20, 23-28, 30-33, 35-38, 40-43, 46-49 and 56-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Priority

Receipt is acknowledged of paper submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Request for Continued Examination Application

The request filed on 07/31/2003 for a Request for Continued Examination Application (RCE) under 37 CFR 1.114 based on parent Application No. 08/930449 is acceptable and a RCE has been established. An action on the RCE follows.

Preliminary Amendment Status

Acknowledgment is made of entry of preliminary amendment filed June 04, 2003 which was entered on July 31, 2003 after the filling of the RCE .

Therefore claims 1, 12, 20,25,30,35, 40, 46 and 56 as amended by the of 6/04/2003 and claims 4 to 11, 13-18,21-23, 26-28,331-33,36-38,41-43,47-49 and 63 as previously recited are currently pending in the application.

Claims 19,24,29,34,39,44,45 and 50-555 have been cancelled by the amendment .

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1,2,4-18,20,23,25-28,30-33,35-38,40-43,46-39 and 56-63 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-2, 4-18,20, 23,25-28,30-33,35-38,40-43,46-49 and 56-63 are rejected because the phrase "terminated by hydrogen atoms in the hydrogen-containing atmosphere of inert gas" renders the claim indefinite because it is not clear what Applicants' intend to include/exclude by the phrase. If Applicants' mean "terminated by hydrogen atoms in atmosphere consisting of the hydrogen-containing gas and the inert gas." the same may be recited in the claims.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having

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ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2,4-18,20-23,25-28,30-33,35-38, 40-43 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cathey et al. (U.S. Patent No. 5,329,207 herein after Cathey) newly applied and Nakamura (U.S. Patent No. 5,200,630, herein after Nakamura)) previously applied.

With respect to claims 1,12, 20, 25, 30 35 and 40 in addition to the teachings previously stated , the presently recited steps

Forming a thin film (Cathey fig. 3A # 8, col.5 lines 43-45).

Crystallizing at least a surface of the thin film by applying energy to the surface of the thin film, at least the surface layer of thin film is " melted by the applied energy " (See Cathey Fig. 3D col. 5 lines 63-65) crystallized "by cooling solidification" the thin film being melted under hydrogen containing atmosphere of inert gas having a total pressure of at least atmospheric pressure see (Cathey col. 5 lines 40-43, and col. 1lines 39-43, also col. 6 line citing 4,330,363 describing argon gas laser).

Cathey does not specifically mention to reduce the scatter of melted thin film and to make the distance sufficient for the reduced scatter wherein unpaired bonding electrons on the surface of the thin film during the cooling solidification are terminated by hydrogen atoms in the hydrogen-containing atmosphere of inert gas.

However, Nakamura in Table 2 and col. 5 lines 1-35 describes to reduce the scatter of melted thin film and to make the distance sufficient for the reduced scatter

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wherein unpaired bonding electrons on the surface of the thin film during the cooling solidification are terminated by hydrogen atoms in the hydrogen-containing atmosphere of inert gas (i.e. the dangling bonds being compensated for by hydrogen) to improve the mobility of carriers .

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include the dangling bond compensation taught by Nakamura in Cathey's method steps which includes hydrogenating the grain boundaries to improve mobility of carriers. (Nakamura col. 5 lines 28-35 and Cathey col. 6 lines 57-59).

With respect to claims 20 and 25, it is argued that the prior art does not teach, the high energy is supplied to the thin film with the "introduction window disposed at a location resistant to adherence of components of the thin film when the high energy is supplied to the thin film".

However as previously pointed out Nakamura in figure 6 describes the introduction window disposed at a location resistant to adherence of components of the thin film when the high energy is supplied to the thin film.

Further current case law as stated in *In re Ludtke* , "since only alleged distinction between applicants' claims and reference is recited in functional language (namely the window being positioned so that the thin film components are resistant to adherence), it is incumbent upon applicants' , when challenged, to show that device disclosed by reference does not actually possess such characteristics . See also *In re Best* 195 USPQ 430, 433 (CCPA 1977) .The burden on applicant to rebut an inherency rejection applies to product and process claims. (applicants' arguments that Nakamura does not

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specifically state the position of the window is not persuasive because an inherent disclosure by definition would not specifically state the positioning and functionality of the elements in question).

Further more case law, *In re Swinehart*, 169 USPQ 226 (CCPA 1971), states " It is elementary that the mere recitation of a newly discovered function or property , inherently possessed by things in the prior art, does not cause a claim drawn to distinguish over the prior art. Additionally, where the Patent Office has reason to believe that a functional limitation asserted to be critical, for establish (sic.) novelty in the claimed subject matter may, in fact , be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown in the prior art does not possess the characteristic relied on." (emphasis supplied). Under any of the above stated case *Nakamura* teaches the introduction window disposed at a location resistant to adherence of components of the thin film when the high energy is supplied to the thin film.

With respect to claim 40 the applicants' also allege that *Nakamura* does not teach the gas flow from the thin film in approximately the same direction as the reflection path.

First of all the mere recitation of the gas flow from the thin film in a particular direction does not patentably distinguish it over the prior art.

Assuming *arguendo* the recitation that direction of the gas flow from the thin film is approximately in the same direction as the reflection path is patentably distinguishable, *Nakamura* in fig. 6 and col. 4 lines 50-53 teaches the gas flow

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Hydrogen) from the thin film in approximately the same direction (hydrogen gas to be vented out of the chamber through outlet 61) as the reflection path (reflection of hydrogen and plasma by mirror 58 through window 52 to reach thin film 53. Further more Reflected energy has a specular component which goes straight back to the source. Scattered energy has a wide spread and its direction is indeterminate. Also the flow shown in figure 3 is perpendicular to the scattered energy in some areas).

Claims 2 and 5-11 were alleged to be allowable because they dependent on allowable claim 1.

However as shown above claim 1 is not allowable therefore claims 2 and 5-11 are also not allowable.

Further more Cathey in col. 4 line 25 describes the thin film to be a semiconductor film (claim 2)

Cathey inherently discloses atmospheric conditions because it does not mention a specific atmospheric condition. (claim 4).

Nakamura in col. 4 lines 54-68 discloses the use of an inert gas along with hydrogen (Claim 5).

The recitation of claim 6 (hydrogen halide), claims 7-8(Argon), is well known in the art.

The recitation of claims 9-11, Cathey discloses high-energy light beam laser source to melt (Cathey col. 6 lines 19-20).

The recitation of claim 12 (gaseous atmosphere containing a component element) see Cathey col. 6 lines 9-15).

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Claims 13-18 were alleged to be allowable because they dependent on allowable claim 12.

However as shown above claim 12 is not allowable therefore claims 13-18 are also not allowable.

Claims 13 and 14 repeat the steps of claims 4 and 5 and is rejected for the same reasons.

Claim 15 the use of Silane is well known.

Claims 16-18 repeat the steps of claims 9-11.

Claims 21-23 were alleged to be allowable because they dependent on allowable claim 20.

However as shown above claim 20 is not allowable therefore claims 21-23 are also not allowable.

Claim 21 repeats the steps of claim 2 and is rejected for the same reasons.

Claim 22 metallic film (Cathey col. 4 lines 14-15).

Claim 23 repeats the earlier recitation namely the high energy source is light. Cathey col. 6 lines 19-20).

Claims 26-28 were alleged to be allowable because they dependent on allowable claim 25.

However as shown above claim 25 is not allowable therefore claims 26-28 are also not allowable.

Claims 26-28 repeat the steps of claim 21-23 above and are rejected for the same reasons.

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Claims 31-33 were alleged to be allowable because they dependent on allowable claim 30.

However as shown above claim 30 is not allowable therefore claims 31-33 are also not allowable.

Claims 31-33 repeat the steps of claim 21-23 and 2,4 and are rejected for the same reasons.

Claims 36-38 were alleged to be allowable because they dependent on allowable claim 35.

However as shown above claim 35 is not allowable therefore claims 36-38 are also not allowable.

Claims 36-38 repeat the steps of claim 21-23 and 2,4 and are rejected for the same reasons.

Claims 41-43 were alleged to be allowable because they dependent on allowable claim 40.

However as shown above claim 40 is not allowable therefore claims 41-43 are also not allowable and are rejected over Cathey, Nakamura and Jp'722 for reasons stated above and in the Office action mailed 11117199 (incorporated here by reference).

Claims 46 and 56 to the extent under stood were said to be allowable because

Allegedly Jp-'722 does not show the thin film being irradiated by a high energy beam that has been previously reflected by the thin film.

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The recitation of the film being also irradiated by a reflected beam does not patentably distinguish the claim over the prior art when the film is irradiated by the beam

However Jp-'722 fig.6 shows substrate 53 being irradiated by a beam, some of the beam will be reflected by the substrate and because of the window the beam will travel to mirror 58 and will be reflected back on to substrate 53.

Therefore claims 46 and 56 are rejected over Cathey, Nakamura and Jp'722 for reasons stated above and in the Office action mailed 11/17/99 (incorporated here by reference).

Claims 47-49 were said to be allowable because they dependent on allowable claim 46.

However as shown above claim 46 is not allowable therefore claims 47-49 are also not allowable.

Claims 47-49 repeat the steps of claim 21-23 and 2,4 and are rejected for the same reasons.

Claims 57-61 were alleged to be allowable because they depend on allowable claim 56.

However as shown above claim 56 is not allowable therefore claims 57-61 are also not allowable and are rejected over Cathey, Nakamura and Jp'722 for reasons stated above and in the Office action mailed 11/17/1999 (incorporated here by reference).

Claim 62 was said to be allowable because it depends on allowable claim 1.

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However as shown above claim 1 is not allowable and therefore claim 62 is also not allowable.

Further more claim 62 (repeats the steps of claim 1) a thin film electronic device by crystallizing the surface of the thin film in hydrogen atmosphere (Cathey col. 4 lines 1-10, col. 6 line 56-57, etc.).

Applicants' do not make any reference to claim 63 or state whether they traverse the previous rejection of claim 63 .

It is noted that claim 63 repeats the steps of claim 2 and is rejected for the same reasons.

Applicants' contention that Cathey and Nakamura do not disclose the steps of :

" crystallizing at least a surface layer of the thin film by applying energy through a window that exhibits transparency too the energy to the surface of the thin film, wherein a distance between the widow and the thin film is more than about 20mm, and at least the surface layer of the thin film is melted by the applied energy and crystallized by cooling solidification, the thin film being melted under a hydrogen-containing atmosphere of inert gas having a total pressure of at least atmospheric pressure, wherein unpaired bonding electrons on the surface of the thin film during the cooling solidification are terminated by hydrogen atoms in the hydrogen-containing atmosphere on inert gas to reduce the scatter of melted thin film and to make the distance sufficient for reduced scatter is not persuasuve for reasons et out under the rejection above where all these steps were shown to be obvious in view of the applied art.

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Any inquiry concerning this communication or earlier communication from the examiner should be directed to Steven H. Rao whose telephone number is (703) 306-5945. The examiner can normally be reached on Monday- Friday from approximately 7:00 a.m. to 4:30 p.m.

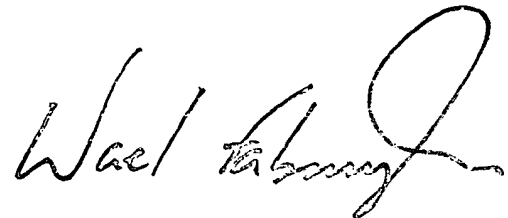
Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. The Group facsimile number is (703) 308-7724.



Steven H. Rao

Patent Examiner

September 28, 2003.



SUPERVISORY PRIMARY EXAMINER
TECHNOLOGY CENTER 2800